



EPA Region 7 TMDL Review

<i>TMDL ID</i>	222	<i>Water Body ID</i>	IA 03-NKS-00330-L_0
<i>Water Body Name</i>	Arbor Lake		
<i>Pollutant</i>	Siltation and Nutrients		
<i>Tributary</i>			
<i>State</i>	IA	<i>HUC</i>	070801060204
<i>Basin</i>	Skunk River		
<i>Submittal Date</i>	12/16/2002		
<i>Approved</i>	Yes		

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

EPA received the Iowa submittal letter dated December 13, 2002 on December 16, 2002.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

Excessive sediment and nutrients are identified as the cause of impairment to Arbor Lake's aquatic life and primary contact recreation uses. Iowa does not have a numeric water quality criterion for siltation or nutrients. The state's narrative standard states, the physical and chemical characteristics of the water body should not be altered by excessive sediment or nutrients to cause reductions in aquatic habitat, spawning, reproduction and development, or sport fishing. Using both CNET and EUTROMOD modeling the current phosphorus load to the Lake is determined to be 2,490 pounds/year and the current sediment delivery was predicted to be 546 tons/year. Based on Carlson TSI values and the phase I target to reduce the trophic state of Arbor Lake to below a hypereutrophic level, a 56% reduction is necessary. This reduction would result in a phosphorus loading of 1,100 pounds/year and 240 tons/year of silt. Achievement of this loading rate is

expected to result in WQS attainment. This is a phased TMDL.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Water quality standards and beneficial uses are described as well as applicable narrative criteria. A phase 1 numeric expression for sediment delivery to the lake is provided and is site specific to the watershed. CNET and EUTROMOD water quality models were used to determine current loading in the watershed, and develop load capacities that will insure water quality standards attainment. A Phase 2 surrogate measure is also identified as a fully supporting Class B aquatic life use which will be determined in accordance with the Statewide Biological Sampling Plan protocol.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

The concern was that sediment and excess nutrients may be impacting the fishery of the lake either directly or indirectly through loss of habitat, interference with sight feeding fish and the benthic community, and/or loss of macrophyte cover, which ultimately can result in an imbalance in the fish community. Since excess sediment and nutrients may impact aquatic life in this lake, the target includes both sediment and nutrient loads to the lake and measurement of the aquatic life within the lake.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

There are no permitted point source contributions of sediment and nutrients in the watershed. Non-point source contributions are fully described. The watershed is dominated by urban run-off from the city of Grinnell. Approximately 25% of the watershed is in rowcrop production. This area contributes sediment and nutrients through sheet and rill erosion, but is considered secondary in comparison to urban runoff. Gully erosion is not perceived to be a problem.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

Phase 1 of the TMDLs is to reduce current sediment and nutrient loads by 56%. Phase 2 will evaluate the effect the sediment and nutrient load targets have on the aquatic life community in the lake and allocations may be revised based on this assessment. The load allocation for sediments is identified as 240 tons/year, and for nutrients it is 1,100 pounds/year of phosphorus.

WLA Comment

The wasteload allocation is zero.

LA Comment

The load allocation for sediment is 240 tons per year and for total phosphorus, 1,100 pounds per year. The total load allocation equals the load capacity.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The margin of safety is implicit based on the Phase 2 surrogate measure of attainment of the Class B aquatic life use, and the wetland project, which will provide further reduction in sediment and nutrient delivery rates.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

A yearly allocation is used since sediment and nutrient loading varies substantially by season and between years, and the impacts are felt over multi-year timeframes.

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

Public meetings were held in Des Moines and Grinnell on January 14, 2002 and on January 28, 2002. A public meeting was again held in Grinnell on November 20, 2002 to present and discuss the draft TMDL.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

In-lake water monitoring will also be completed as part of the Iowa Lakes Survey, which includes three times per year for each of the field seasons 2000-2004. The DNR Fisheries Bureau will conduct an assessment of the lake in accordance with the Statewide Biological Sampling Plan protocol.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

Reasonable assurances are not required in the TMDL because there are no point sources contributing to the impairment in the watershed.
